

Employment of the Expeditionary Fire Support System

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Employment of the Expeditionary Fire Support System

Timothy M. Slinger  
Captain USMC

Expeditionary Warfare School 2004-2005  
Conference Group 2, FACAD: Maj. Adkinson  
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## **Introduction**

Over the past few years there have been many articles published within the Marine Corps Gazette about which system the Marine Corps should incorporate as the Expeditionary Fire Support System (EFSS). The U.S. Marine Corps Systems Command (MARCORSYSCOM) ended any argument in November 2004 when it awarded the EFSS contract to General Dynamics and their partners TDA Armaments SAS, and the European Aeronautic Defense and Space Company for their RT 120mm Rifled Mortar System.<sup>1</sup> The decision to develop a 120mm mortar vice the 105mm as the EFSS is in keeping with General Michael W. Hagee's, Commandant U.S. Marine Corps, directive "to prevail on tomorrow's battlefields, we must continue to intelligently implement new concepts, employ new organizational tools, and field modern weapons and systems." <sup>2</sup> The EFSS will be the third leg in the triad of fires and will complement the LW155mm (or M777) and the High Mobility Artillery Rocket System (HIMARS) already in production.

Since the Marine Corps has decided on the weapon system that will complete the triad of fires, the debate about the differences in 120mm and 105mm needs to end. The decision to develop the RT 120mm mortar needs to be embraced by the artillery community which should aid in the decision on how the mortar should be employed.

The Marine Corps' vision for the future employment of the EFSS is to be the "indirect fire support system for the vertical assault element of the ship-to-objective maneuver (STOM) force,"<sup>3</sup> The STOM force will be the tactical application of operational maneuver from the sea (OMFTS). In years to come the Marine Corps, partnered with the Navy, will be able to establish a sea base in order to concentrate on the littoral regions of the world striking the enemy where his is least expecting.<sup>4</sup> As the future becomes the present the Marine Corps will see that the triad of fires (light weight 155mm howitzer, HIMARS, and the EFSS) will possess the "greatest possible range and flexibility of employment for Operational Maneuver-from-the-Sea (OMFTS)"<sup>5</sup>

The concept of OFMTS is the correct path for the Marine Corps, but will take many years to implement. The EFSS will be a reality and ready for operational use in 2006. The answer to the question: *"how to employ the EFSS and prepare it for OMFTS?"* is to replace the 155mm aboard Marine Expeditionary Units (MEU) with the RT 120mm mortar allowing the M198 155mm to deploy with the Marine Expeditionary Force. This will give the MEU(SOC) Commander an indirect fire support system that is lethal, mobile and deployable.

### **Deployability/Transportability**

On today's Marine Expeditionary Unit-Special Operations Capable (MEU{SOC}) a six-gun M198 battery is the primary indirect

fire support element for the Battalion Landing Team (BLT). The LW155 will replace the heavier M198 beginning in 2005 for all artillery batteries. Compared to the M198 and the LW155, the EFSS has the size and weight needed for fast and efficient embarkation and debarkation from all current and future naval vessels. The EFSS will also be able to be internally lifted in both the MV-22 Osprey and the CH-53 Helicopter.<sup>6</sup> The M198 is large and hard to maneuver around the well decks of the current amphibious vessels. Considering the M198 in stow position, the howitzer has a length of twenty-four feet, five inches long and a width of nine feet, two inches, a total of 372 square feet.<sup>7</sup> If a MEU(SOC) deploys with a battery or six M198's a total of 2,232 square feet needs to be considered when loading a ship. Currently General Dynamics is reporting the EFSS to have nine feet, nine inches in length with a width of six feet, four inches, which will bring the RT 120mm Mortar to sixty square feet.<sup>8</sup> If the MEU(SOC) would deploy with an eight gun battery, the total square feet would be 480. The cargo master would save approximately 1752 square feet of space.

At 1,283 pounds the RT 120mm mortar has an advantage over the heavier M198 howitzer.<sup>9</sup> The Marine Corps vision is for the system to become the "primary indirect fire support system for the vertical assault force of the STOM force."<sup>10</sup> The primary lift capability for the vertical element will be the MV-22 Osprey, which has a 10,000 pound payload ability. With its size

and weight the RT 120mm mortar will be internally lifted with its primemover, basic ammo load, and portions of the crew; an exceptional asset to a raid force or an assault force.<sup>11</sup> Due to the mortar's size and weight, an entire eight-gun battery will be lifted by a landing craft air cushioned (LCAC). The ability to lift an entire battery of 120mm mortars ashore will give the MEU(SOC) Commander the flexibility to integrate more surface indirect fires into the scheme of maneuver.

The EFSS is more deployable than the much heavier 155mm due to its size and weight. A smaller weapon system and prime mover would allow the combat cargo officer more flexibility as to where to stow the system when underway. The EFSS will give the MEU(SOC) more options, surface or air, in determining how to deploy the mortar with the assaulting force.

### **Lethality**

Lethality can be defined in many ways; for the purpose of this paper we will discuss the lethality as the combination of range, accuracy, caliber, ammunition type, and rates of fire. The 155mm can range 18,100 meters using conventional munitions and up to 30,000 meters using rocket assisted projectile (RAP). The 155mm gives the MEU commander a burst radius of fifty meters and depending on charge and range can have a probable error of 30 meters (up to 50 meters for M119A1 firing at maximum range). The stock of ammunition includes high explosive (HE), dual purpose

improved conventional munitions (DPICM), and minefield employment capability. The MEU commander may want to maintain the 155mm capability within his grasp for lethality reasons. Although the EFSS does not possess as the lethality of the 155mm, it will possess the lethality needed during a MEU(SOC) deployment.

A main attribute that MARCORSYSCOM wanted to ensure during the development of the EFSS was that the "maximum range for the standard high explosive projectile shall be no less than seven kilometers."<sup>12</sup> During the post award conference giving by General Dynamics, they stated that the maximum range for unassisted rifled munitions will be over 8000 meters, with an ability to range 13,000 meters rocket assisted.<sup>13</sup> The RT 120mm mortar will also bring the same munitions to the battle as the 155mm. Those include HE, Illumination, Obscuration/Incendiary (white phosphorus), DPICM. (Anti-Armor/Anti-Personnel munitions are available but not proposed with the system initially) The burst radius of the mortar round will be approximately 35 meters with a probable error of .6% of range firing at two-thirds its maximum range.<sup>14</sup> This would be an approximate error of 10 to 15 meters.

As any indirect weapon system, the problem of re-supply becomes a logistical one. The ammunition carrier can only carry a total of 24 rounds. With a sustained rate of fire of two rounds per minute, one tube can last up to twelve minutes and up to fourteen minutes if the prime mover carries four more rounds.<sup>15</sup> The rate of fire will increase due to the severity of the mission

culminating at eighteen rounds per minute at the emergency rate.<sup>16</sup> No significant loss from the M198 which also has a sustained rate of fire of two minutes, but artillery batteries can carry thirty rounds combat load (in training) within the prime mover.<sup>17</sup> The EFSS can balance the logistical problem with HMMVS and trailers to carry additional ammunition.

The ability to "mass", bringing all fire support firepower on one unsuspected enemy at one time, is essential to artilleryman. The battery fire direction center (FDC) applies corrections to an arbitrary set of standard conditions of weather, position, and material in order to ensure the 155mm projectile is fired at the exact place and time.<sup>18</sup> The Fire Control System being introduced with the EFSS will have the same capabilities as the battery computer system. It will have a modified point mass ballistic solution, the ability to apply meteorological data, muzzle velocity variants, and registration information all to determine accurate firing data.<sup>19</sup>

Although the M198 has more lethality due to range and a higher caliber; the RT 120mm will have substantial firepower with its ability to mass and the munitions that will be fired. The MEU(SOC) will not need a large amount of lethality, but will need the ability to sustain operations until a Marine Expeditionary Force is able to deploy to the area of operations. The RT 120mm mortar gives the MEU(SOC) the amount of lethality for sustainability.



## **Mobility**

The visionary mission of the EFSS is to support the vertical assault force deep within the area of operations, such as foot mobile infantry traveling approximately 2.5 mph off-road. The RT 120mm mortar has the ability to travel at a speed of 5 mph off-road, and 10 mph unimproved road.<sup>20</sup> With the decrease in range from the 155mm the RT 120mm mortar emplacement time and displacement time has significantly decreased. The 155mm battery has a standard emplacement time of twelve minutes.<sup>21</sup> The emplacement time for the EFSS should drop to approximately 2 minutes.<sup>22</sup> This will give the MEU commander a fire capable indirect fire system within minutes of employment ashore.

The general design of the mortar gives it an ease of mobility. In the post award brief General Dynamics describes the mobility of the system as a function of the base plate, "with a raised surface and a specialty designed shape the mortar can be adapted to all types of ground."<sup>23</sup> The design of the base plate will allow Marines to fire at maximum charges on all types of ground with very high stability.<sup>24</sup> The base plate design is simple enough to allow ease of extraction, while the torsion bars are high to allow for high mobility. All types of light vehicles can also tow the RT 120mm mortar.<sup>25</sup>

The M198, although rugged and Marine tested, has a maximum terrain slope of a ten degree cant.<sup>26</sup> Finding suitable terrain in mountainous or rocky regions can be difficult. To

allow the least amount of stability and displacement while firing, spades must be dug into the ground. This can be a problem and time consuming on rocky or sandy terrain.

The EFSS will give the MEU(SOC) commander greater mobility in that it can be placed on a smaller footprint, and emplace and displace at a faster rate than the larger 155mm. With a speed of ten miles per hour on unimproved roads the RT 120mm mortar able to maintain the momentum of the infantry.

## **Conclusion**

The EFSS should be the principal indirect fire support system for a Marine Expeditionary Unit (Special Operations Capable). Although it does not give the lethality of a 155mm, the 120 RT can bring destruction by way of mass and various ammunitions to the battlefield. It can also give the MEU commander a more deployable and mobile weapon system. With its lightweight, and low dimensions the commander can vertically lift the EFSS with the Vertical Assault force or it can be transported in a landing craft. With speed and mobility becoming the wave of the future, the MEU commander will need a weapon system to maintain momentum and have the lethality to support the infantry.

The mission of the MEU(SOC) states in Marine Corps Order 3120.9B, a MEU(SOC) is to "provide a forward deployed, flexible, sea based MAGTF capable of rapidly executing amphibious operations, designated maritime special operations, MOOTW, and

supporting operations to include enabling the introduction of follow on forces."<sup>27</sup> In today's climate the Marine Corps is fighting as Marine Expeditionary Forces. The RT 120mm mortar can allow the MEU commander the flexibility, and rapid deployment to any contingency around the world. It would also give the commander the indirect fire support needed to enable sustainment operations to introduce follow on forces. As Major General Huly stated during a lecture to Expeditionary Warfare School students "Marines deploy as MEU's and employ as MEF's."

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